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Research Memorandum 68-10

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**INTERNAL ANALYSIS OF THE GROUP AWARENESS TEST
FOR THE DIFFERENTIAL OFFICER BATTERY**

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6/ INTERNAL ANALYSIS OF THE GROUP AWARENESS TEST FOR THE
DIFFERENTIAL OFFICER BATTERY

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INTERNAL ANALYSIS OF THE GROUP AWARENESS TEST FOR THE DIFFERENTIAL OFFICER BATTERY

BACKGROUND

The Group Awareness Test was developed as part of an extensive program of research to determine the extent to which ability to meet the psychological demands of combat, administrative, and technical officer assignments can be differentially predicted by psychological measures. As the first step of this program, an extensive battery of experimental tests was constructed and administered to over 6000 officers at entry on active duty in 1958. On the basis of item analysis against performance ratings after about 18 months of service, the earlier battery--the Differential Officer Leadership Battery (DOL)--was revised and shortened to form the Differential Officer Battery (DOB). In 1961 and 1962, the DOB was administered to about 4000 officers at entry on active duty. The instruments of the DOB are being validated in two broad types of criterion situation: 1) carefully standardized measures making up an integrated exercise administered in a simulated combat environment at the Officer Evaluation Center established for the purpose; and 2) ratings of performance in both active combat theater operations in Vietnam and in combat readiness operations in Korea, Europe, and CONUS.

OBJECTIVE

The Group Awareness Test (GAT) was included in the experimental DOL in an effort to measure the officer's empathy or ability to estimate the opinions of peers and subordinates. As first constructed¹, the GAT consisted of two forms, A (DA PT 3400) and B (DA PT 3401), each composed of 75 job related attitudinal statements. When the DOL was revised and shortened to form the DOB, the GAT was reduced to a single form of 75 items (DA PT 4093)². The items are all statements of opinion or attitude with regard to work habits, leader-follower relationships, human nature, and various kinds of pursuits and activities. The examinee is instructed to estimate for each statement what proportion of a representative group of NCOs, recruits, and ROTC graduates would indorse the statement. There are thus three responses to each of the 75 items, producing a total of 225 scorable responses. The format for responding is such that each item on the answer sheet is followed by three rows of five alternatives. In each row, the alternatives are represented by the letters A, B, C, D, E.

¹ Bornstein, H., R. Sadacca, and R. Phillips. Development of differential officer leadership experimental test battery. Research Memorandum 57-27. December 1967.

² Willemin, L. P. Prediction of officer performance. Technical Research Report 1134. March 1964.

At the top of each page of the test booklet, the following code for the alternatives is printed: A = Very few (0% - 19%); B = Few (20% - 39%); C = About half (40% - 59%); D = Many (60% - 79%); E = Very many (80% - 100%).

The present Research Memorandum describes the internal analysis of the GAT, as revised, for the purpose of deriving psychologically homogeneous scales for scoring the instrument. Specific objectives were:

1) to identify relatively independent factors which can be reliably based on exclusive sets of items in the GAT; 2) to relate such factor scales to each other and determine to what extent such factors correspond to the major hypothesized dimensions of combat, administrative, and technical requirements; and 3) to select scales for scoring and validation in subsequent research.

PROCEDURES

SAMPLE

For this study and for others involving internal analysis of other DOB measures, a stratified sample of 900 cases was selected from the 4000 to whom the DOB was administered, 100 cases being randomly selected from each of nine branches of service: Infantry, Armor, Artillery, Engineer, Signal Corps, Ordnance, Quartermaster Corps, The Adjutant General, and Finance.

ANALYSIS OF GAT RESPONSES

As a first step, frequency distributions for the five response categories of each of the 225 items in the GAT were prepared. None of these distributions was considered sufficiently skewed to preclude calculation of product-moment correlation coefficients. Intercorrelation matrices (Pearsonian r) were prepared for the 75 items separately for each of the three estimation populations--NCO, recruit, and ROTC graduates. These matrices were then factor analyzed, using the principal axes method. Twenty factors were extracted from each of the three matrices and successively greater numbers of factors were rotated, by the varimax method, beginning with 2 and terminating with 15. All possible pairs of factors from the three 15-factor rotations were correlated according to their factor loadings, resulting in a 45 by 45 matrix.

While the factors seemed generally interpretable, most of them were defined by few items. For each of the populations, the largest proportion of variance was accounted for by the first factor. The items loadings on this factor, while congruent across the three estimation populations, were somewhat heterogeneous in content. The characteristic all seemed to have in common was a sort of unassailable wisdom. Put another way, they had a considerable loading of social desirability. Proportions of responses

obtained with the opinion survey described below verified this interpretation. Nearly all the items with significant loadings on factor I produced very high levels of agreement. A few of the items negatively loaded on factor I showed the opposite characteristic of very low agreement. The second factor in all three estimation populations, defined by fewer items, also showed considerable congruence over the three analyses. These items had in common a general cynicism toward human characteristics. Beyond the first two factors, no factors showed high levels of congruence over all three estimations, a characteristic considered desirable in the final scales for operational use.

ANALYSIS OF ACCURACY SCORES

In further analysis utilizing accuracy scores, examinees' estimates of the percentages of NCOs, recruits, and officers indorsing each GAT statement were compared with percentages of NCO, recruit, and officer samples indorsing the statement. The instrument for obtaining the latter sets of data was the General Opinion Survey (GOS). Two forms of the GOS (PT 3406 and PT 3407) corresponding to the earlier long forms of the GAT were administered in late 1959 and 1960 to approximately 400 men in each category. Responses to those items which were included in the revised GAT were tabulated to provide a standard against which to calculate the accuracy of estimates by officers taking the GAT. A scoring key for the GAT was made up based on the accuracy with which the responses of NCOs, recruits, and officers (as given in the GOS) were estimated. A response alternative was keyed as correct if the percentage of agreement in the GOS fell within the limits assigned to that alternative in the GAT code, whether the actual percentage fell in the middle of the interval or at one of the extremes. For 6 items, both the A and B responses were keyed as correct, since keying only the A response would have resulted in a p-value of less than .05.

Each of the 225 responses of the 900 men in the present sample were scored as either right or wrong according to the key. Next, all 225 responses were intercorrelated in a single matrix, using tetrachoric r. This matrix was then factor analyzed by the principal axes method. Twenty factors were extracted. Beginning with the first two factors, successively larger combinations of factors were rotated, using the varimax method, until all 20 factors had been rotated.

The first factor, stable through all the rotations, corresponded closely to the first factor obtained in each of the three analyses of estimation responses. This result is not surprising, since the items had common variance in the response patterns and also shared similar agreement patterns in the percentages which went to make up the key. In nearly all cases when an estimate of agreement for one of the three populations was significantly loaded on this first factor, the estimates for the other two populations were similarly loaded.

Beyond the first factor, the other factors were not interpretable on the basis of item content. Other factors appeared in the pattern of keyed responses, but these patterns did not appear psychologically meaningful. Only the first factor seemed to reflect patterns uncovered in the analyses of GAT responses. The factor of cynicism toward human nature, which emerged rather clearly from the raw responses, was not apparent in the analysis of accuracy scores. The number of intercorrelations above .50 was very low, and most of these involved items loaded on the first factor. It was concluded that the superimposition of the scoring key on the responses had masked any patterning which might have been meaningful, with the exception of the social desirability represented by the first factor in all the analyses.

ADDITIONAL SCORING PROCEDURES

In view of the lack of success in finding clear subscales among the GAT responses or the accuracy scores, only two alternatives seemed available for clustering the items of the GAT: The items could be classified in terms of patterns of responses for the three samples who were administered the GOS, or in terms of judged content of the items without regard to patterning of responses in either GAT or GOS.

In the item key based upon responses to the GOS, the items fell into several categories with possible significance for scoring. Of the 75 GAT statements, 15 were indorsed by 80% or more of the men in all three populations and were therefore keyed for the E estimation responses in all three cases. An additional 4 items were indorsed by less than 20% of the men in each of the three populations and were keyed for the A response. These 19 items (referred to as the extreme or EX cluster) would be expected to be involved in scores influenced by generalized position response tendencies. There are 15 more items which received similar responses across the three estimation populations but which were not at the two extremes (the middle or MI cluster). Of these, 2 were keyed for the B response, 5 for the C response, and 8 for the D response. It is possible that scales could be constructed using combinations of these items which either cancel or at least account for response tendencies not related to item content or to the population being estimated.

. Of the remaining items, 9 show a pattern of response, using the key based on GOS responses, pairing the two leadership groups, NCOs and recently commissioned officers. For these items (labeled the CO cluster), proportions of agreement for the officer and NCO groups were within a few percentage points of each other and the keyed alternatives were the same; the proportion for recruits, on the other hand, was either higher or lower by a substantially larger margin and resulted in the keying of a different alternative. (On four of these items the recruit proportion of agreement was lower, on five items higher than that of the other two groups). It could be argued that these items represent statements which differentiate leadership and nonleadership groups. An additional 12 items paired the GOS responses

of the two enlisted groups (recruits and NCOs) and differentiated them from the responses of officers. These items (labeled the enlisted or EN cluster) fit the same criteria as those pairing the two leadership groups against recruits. On two of these items, agreement by officers was higher than that of the other two groups, and on ten it was lower. These items appear to differentiate between officers and enlisted men. There was only one GOS item on which recruits were paired with officers and differed from NCOs. On 6 items, the responses of the three populations on GOS were substantially different for all three groups (labeled the all different or AD cluster). On 4 of these items, recruits showed the highest degree of indorsement with NCOs next and officers lowest. The four with similar patterns might possibly represent degree of responsibility, degree of ability, or simply amount of education. On one of the two other items, proportions of agreement from highest to lowest were for NCOs, recruits, officers--on the other, officers, recruits, NCOs. It is hard to know what these items represent. The remaining 13 items could not be fitted into any of the preceding categories. Although the keyed responses differed, differences in percentage of agreement were small.

In still another procedure, items were sorted subjectively in terms of content. On this basis, 63 of the items were sorted into 10 scales: (1) Common man, 4 items; (2) Conservative virtue, 3 items; (3) Health, 3 items; (4) Technical crafts, 9 items; (5) Enjoyment of living, 6 items; (6) Independence and personal freedom, 8 items; (7) Manipulative social relations, 10 items; (8) Attitudes toward war, 5 items; (9) Faith in Army leadership, 6 items; (10) Soldier duty, 9 items.

To assess the possible use of scales based upon item clustering by GOS responses and by subjective item sorting, a random sample of 100 cases taken from the 900 described above were scored on the two sets of scales. The EX cluster was also scored in terms of the average response estimate given, assigning values of 1 through 5 to alternatives A through E, respectively. The order of values assigned to the alternatives for items keyed A for all groups was reversed. The MI cluster was also scored in terms of the average directional deviation from the keyed value. Each of these scales was scored for each of the three estimation populations, NCO, recruit, and ROTC graduate. In addition to these scores, a total rights score was obtained for each of the estimation populations over the 75 items. Three scores were also computed to show the degree to which the estimates of the examinees differed for two of the estimation populations on those items on which the GOS responses showed that the two populations actually did differ. In each case, this score was a ratio of amount of difference in the estimates for those items which did show a difference in GOS response to those which did not. The three scores were: 1) recruits versus officers, 2) NCOs versus officers, and 3) recruits versus NCOs.

The means and standard deviations of each of these 57 trial scores were computed and the scores were intercorrelated using product-moment r . The means and standard deviations revealed a consistent tendency for the estimates of officers to rank at the top, of NCOs next, and of recruits

at the bottom in terms of both accuracy and general social desirability. Scores on good health, enjoyment of living, soldier duty, and similar concepts were high for recruits and low for officers. This patterning of means, along with the intercorrelations, suggested that the scales were not measuring much that was independent of general overall accuracy or social desirability.

DERIVING THE FINAL SCALES

Since the factor analyses of the estimation responses for each of the three populations had provided at least two scales, social desirability and cynical view of human nature, it was determined to go back to these analyses to see whether other scales could be derived even if they could be scored for only one or two of the estimation populations. Since the later emerging factors were typically defined by only one or two items, the five-factor rotations were chosen as the focus for investigation. In all three analyses, the root for the sixth factor extracted was the first to have a value of less than one. Table 1 gives descriptive titles for the factors in the three five-factor rotations.

Using the loadings from the five-factor rotations, it proved possible to cluster 61 of the 75 items into 8 scales, based on patterns of loadings. While most of these scales can hardly be called factorially pure, they do show considerable content homogeneity, at the same time having at least minimal factorial justification. The rationale for grouping is given below, along with a description of scale content. The three five-factor rotations are presented as tables A-1, A-2, and A-3. The scales with GOS keys are given in Table A-4.

SCORING GAT SCALES IN DOL

The 6000 men who took the earlier predictor battery, DOL, received only one of the two earlier forms of GAT, Form A or Form B. Since the 75 items making up the DOB form of the GAT were taken from both forms, these men were not exposed to all of the items making up the 8 scales. For some scales the forms contained a sufficient number of items to be scorable in the validation analysis of the DOL. Other scales will have to be omitted. Table A-5 gives the scales for each of the GAT forms and indicates those which will be scored and validated for the men receiving each form.

Scale 1 (Good work habits). This scale contains 8 items, all of which load most heavily on factor I for all three estimation populations. All the items refer to the desirability of quiet, selfless dedication to work, being careful in work, taking care of machinery, not being a glory hunter, working neatly, etc. This scale most clearly represents the first and major factor which has been referred to above as social desirability, although other scales contain items loading highly on this factor.

Table 1

THE FIRST FIVE FACTORS IN ANALYSIS OF CAT ESTIMATES FOR
NCO, RECRUIT, AND ROTC POPULATIONS

NCO Analysis

Factor I	Social Desirability (Unassailable Wisdom)
Factor II	Cynical View of Human Nature
Factor III	Educated Sophistication
Factor IV	Individual Toughness (Authoritarianism)
Factor V	(Uninterpretable)

Recruit Analysis

Factor I	Social Desirability (Unassailable Wisdom)
Factor II	Cynical View of Human Nature
Factor III	Educated Sophistication
Factor IV	Human Relations at Work (Leadership) and Play (Social and Family)
Factor V	Individual Toughness (Without Authoritarianism)

ROTC Analysis

Factor I	Social Desirability (Unassailable Wisdom)
Factor II	Cynical View of Human Nature
Factor III	Individual Toughness (Authoritarianism)
Factor IV	Educated Sophistication
Factor V	Interesting and Exciting Activities

Scale 2 (Leader-follower relations). This scale contains 9 items, and again the items load heavily on factor I for all three groups. The rationale for selecting these items as a separate scale, aside from the homogeneity of content, is that in the recruit estimation population all these items showed dual loadings on factors I and IV. For the other two estimation populations, the items clearly belong to Factor I. Seven of the 9 items refer to a working man, or a soldier, in relation to a leader or his instructions, or to the organization.

Scale 3 (Fighting man's code). The six items of this scale were grouped because of similar factor loading patterns in the NCO and officer estimation populations. In the analysis based on estimates of NCO responses, all six items showed substantial loadings on factors I and IV, and in the analysis of officer estimates all but one showed loadings on factors I and III (IV in the NCO analysis being the same as III in the officer analyses). The remaining item showed a substantial loading on only factor III for officer estimates. In the recruit estimate analysis, the loadings for these items were predominantly on factor I alone, although two items also showed substantial loadings on factor V. Three items refer to the value of fresh air, exercise, and physical conditioning, two favor unquestioning obedience to orders, and the final item is a statement in favor of universal combat training for soldiers. The package seems to relate to some form of authoritarian syndrome, but the support for such an interpretation is not compelling.

Scale 4 (Marriage and family). Only three items make up this scale, and once again the factor loadings for the recruit estimates are responsible for their separation. For the NCO and officer estimates, the loadings on factor I predominate for each item, while for two of the items the only substantial recruit estimate factor loading is on factor IV. The largest recruit estimate loadings for the third item (item 63) were on factors I and IV, with the loading on factor I predominating. The three items all deal with family and marriage, one with visiting the folks, one with family and children as a source of satisfaction, and one with dating many girls before marriage.

Scale 5 (Cynical view of human nature). Of all the scales, this is probably the clearest and most well defined. All 13 items had their highest loading on factor II for all three estimation populations, and in nearly all cases this was either the only substantial factor loading or clearly predominated. The items all represent a rather jaundiced view of human nature and range from getting on the good side of the boss to indicating that a good combat man needs more guts than brains.

Scale 6 (Educated sophistication). This scale consists of 11 items, and was determined more by factor clustering than by readily apparent item content. In the NCO estimate analysis, all items had their highest loading on factor III; in the recruit estimate analysis, all were substantially loaded on factor III and on only one item was this not the highest loading.

In the officer estimate analysis, 9 of the 11 items had their highest loading on factor IV. The remaining two items had their highest loadings on factor V. These two items, endorsing golf and tennis as good games, were associated with hunting, fishing, flying, etc. in the officer estimates, but in the other two estimation populations were clustered very definitely with this scale. The golf item did have a loading of .21 on factor IV in the officer estimates, but the loading of the same item was .42 on factor V. The two items were included in this scale largely on the basis of strong indications of their belonging found in the NCO and recruit estimation analyses. The content of the remaining items is somewhat varied. Two items state the superiority of the technical man over the combat man in modern warfare, and one states that reading technical material is relaxing. Related items state that one who doesn't know the basic theory should not operate equipment, and that promotions should be given on the basis of examinations. Other items endorse visiting art museums and decry women's smoking in public and boxing as a brutal sport. A final and somewhat puzzling item states that the most important thing in life is to get along with everybody. The only thread which seems to tie all the items together is a sort of polite, educated sophistication.

Scale 7 (Personal integrity). The five items of this scale were grouped largely on the basis of their factor loadings in the NCO and officer estimate analyses. In the NCO analysis, all items had their only substantial loading on factor IV; in the officer analysis, all had their highest loading on factor III. In the recruit estimate analysis, the items loaded on factor V or I (or both, in the case of one item). One item states that a man should stand up for his rights, a second that first sergeants will back up men's grievances. Two other items state that a good man enjoys a tough job and that most men would rather die fighting than be taken prisoner. The final item states that anybody can understand most Army directives. How this last item fits in conceptually is difficult to explain.

Scale 8 (Activities). The six items of this scale have a considerable degree of content homogeneity. All deal with activities which are satisfying, exciting, or enjoyable. They refer variously to hunting, taking machinery apart, fishing, doing dangerous things, learning to fly, and dancing. The factorial justification for their grouping is not as clear. In the officer estimation analysis, all these items had their only substantial loading on factor V. In the recruit analysis, five of the items had a substantial loading on factor V and for four of them this was their highest loading. In the NCO estimate analysis, there was no discernible patterning. Two of the items had their highest loading on factor I, two on factor III, and two on factor IV. In a sample of 100 on whom these scales were scored, the NCO estimate score correlated .61 with the recruit estimate score and .73 with the officer estimate score. These coefficients were as high as the corresponding intercorrelations for any of the other scales, and higher than most.

The remaining 14 items were not assigned to scales. The items are somewhat ambiguous in that they lend themselves to several possible interpretations. The intercorrelation matrix obtained in the 100-man sample appears as Table A-1. As expected, scales 1 through 4, all of which had loadings on factor 1, intercorrelate fairly highly. These intercorrelations are not so high as to prevent some finding of independent validity. Scales 5 and 6 show a good degree of independence from other scales.

DEVIATION SCORING

In keeping with the original purpose of developing an instrument which measures the degree to which the examinee can accurately estimate the opinions of specified groups of coworkers, a second scoring procedure was developed for the GAT. In addition to simply cumulating the raw responses, scaled 1 through 5, a deviation score can be obtained. This score is calculated by subtracting the scale value of the keyed response, based on responses to the COS, from the scale value of the response itself. These deviation scores are then cumulated without regard to sign. In the case of scales 1 through 4, the raw score and the deviation score would be rather highly correlated since the keyed responses tend to be rather uniform over the items (mostly D and E). In the case of the other scales, correlation between the raw scores and the deviation scores would be relatively low. The raw scores would be an indication of the examinee's regard for the population he is estimating--NCOs, recruits, or officers. The deviation score would be a measure of his accuracy in estimating what the group's responses actually are.

CONCLUSIONS

In terms of the objectives of this project, it appears that the following results have been achieved: 1) Eight scales have been constructed from loadings on five factors extracted separately for the NCO, recruit, and officer estimation populations. 2) Four of these scales are rather highly intercorrelated since they all contain items loaded significantly on the first factor, usually in combination with loadings on other factors. The remaining four scales are quite independent, with two appearing to represent rather pure factors. In general, the scales represent adequately the factor structure of the total instrument, although with only moderate factorial purity. 3) The scales derived do not clearly represent the three areas of officer assignment--combat, administrative, and technical. The items assigned to these areas on an a priori judgment basis are rather evenly distributed within each of the scales. Whether any differential prediction is possible with either raw response scoring or deviation scoring will have to be empirically determined.

Independent estimates of the reliability of these scales will be obtained in a new sample. Data have also been obtained by which to determine the effectiveness of the scales in predicting success in the performance exercise conducted at the Officer Evaluation Center, in combat in Vietnam, and in combat-ready units in Korea, Europe, and CONUS.

APPENDIX

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Table A-1

GAT 5-FACTOR ROTATION FOR NCO ESTIMATES

Part I. VARIMAX ROTATION ANALYSIS

PROPORTIONS OF VARIANCE

1	.0828	2	.0386	3	.0341	4	.0357
5	.0150						

HIGHEST LOADINGS

1	.6205	2	.4758	3	.5192	4	.5095
5	-.03029						

COMMUNALITIES

1	.2909	2	.0324	3	.2917	4	.2250
5	.1647	6	.1486	7	.1454	8	.3022
9	.0787	10	.2403	11	.1821	12	.1304
13	.0722	14	.1756	15	.3833	16	.2198
17	.1645	18	.1911	19	.2134	20	.1474
21	.1179	22	.2735	23	.2053	24	.2792
25	.2183	26	.2130	27	.1624	28	.1636
29	.1331	30	.3616	31	.3098	32	.1947
33	.2808	34	.2667	35	.1956	36	.1720
37	.1408	38	.1948	39	.2138	40	.0960
41	.3225	42	.1425	43	.4232	44	.2728
45	.2022	46	.1554	47	.3038	48	.1363
49	.2736	50	.2464	51	.2134	52	.1933
53	.0924	54	.2830	55	.2279	56	.1032
57	.0923	58	.3018	59	.0879	60	.2129
61	.2396	62	.1444	63	.2647	64	.1056
65	.0541	66	.1854	67	.1910	68	.3634
69	.3504	70	.1025	71	.2301	72	.1523
73	.2187	74	.2697	75	.3064		

Table A-1 (continued)

Part II. ROTATED FACTOR LOADINGS											
Items	Factors					Items	Factors				
	1	2	3	4	5		1	2	3	4	5
1	.35	-0.09	-0.12	.34	.02	16	.03	.20	.07	.35	.23
2	.10	.01	.14	-0.03	.01	17	-0.06	-0.01	.29	.22	.17
3	.38	-0.05	-0.10	.36	-0.04	18	.16	.25	.27	.16	.07
4	.19	-0.07	.36	.12	.20	19	.38	.14	.03	.17	.13
5	.22	.24	-0.06	.24	-0.01	20	-0.11	.08	.36	-0.01	.03
6	.19	.03	.14	.24	.12	21	.13	-0.10	.20	.01	-0.23
7	.19	.02	-0.00	.33	-0.05	22	-0.06	-0.15	.45	.17	-0.13
8	.18	.05	.00	.51	-0.04	23	.30	.09	-0.01	.31	-0.11
9	-0.17	.20	.06	.00	-0.07	24	.15	-0.11	.47	.12	.10
10	.38	-0.16	.12	.24	.00	25	-0.06	.37	-0.04	.24	-0.13
11	.13	.39	.02	.04	.04	26	.08	.07	.07	.32	-0.30
12	.09	.52	.03	.11	.09	27	-0.05	.14	.37	-0.02	.05
13	.09	.21	.06	.10	-0.07	28	.12	.35	.03	.04	-0.16
14	.20	-0.02	.19	.27	.16	29	.29	.16	.02	.10	-0.10
15	.48	-0.04	-0.03	.34	-0.08	30	.55	.06	-0.11	.17	-0.10

Table A-1 (continued)

Part II. ROTATED FACTOR LOADINGS											
Items	Factors					Items	Factors				
	1	2	3	4	5		1	2	3	4	5
31	.51	.04	.02	.16	-0.15	46	-0.08	.23	.28	.05	.12
32	-0.05	.43	.05	-0.07	.03	47	.27	.27	.09	.39	.05
33	.09	.48	-0.08	.25	.19	48	-0.02	.05	.32	-0.03	-0.18
34	.46	-0.00	-0.03	.13	-0.20	49	.37	.11	-0.11	.29	-0.17
35	-0.03	.13	.10	.40	-0.37	50	.44	.12	.13	-0.06	.14
36	.06	.36	-0.02	.16	-0.11	51	.34	-0.05	.20	-0.07	.23
37	.32	.09	.11	.12	-0.07	52	.06	.43	.01	-0.00	-0.08
38	.22	.21	.13	.29	.04	53	.18	.11	.19	.09	-0.07
39	-0.22	.09	.39	-0.05	-0.01	54	.40	.15	-0.19	.25	-0.02
40	.23	.11	-0.04	-0.01	-0.17	55	.45	-0.01	.01	.14	-0.07
41	-0.07	-0.18	.52	.03	-0.10	56	.18	.19	-0.02	.18	-0.03
42	.08	.30	-0.04	.00	-0.21	57	.26	.13	-0.07	-0.03	-0.02
43	.62	.02	-0.05	.16	-0.10	58	.54	.05	.09	.03	.04
44	.48	.08	-0.00	.10	-0.17	59	.03	.07	.27	.03	-0.10
45	-0.11	.37	.10	-0.11	.15	60	.25	-0.04	.38	.04	.05

Table A-1 (continued)

Part II. ROTATED FACTOR LOADINGS											
Items	Factors					Items	Factors				
	1	2	3	4	5		1	2	3	4	5
61	.34	.29	.06	-0.01	.19	69	.53	-0.17	.19	.07	-0.02
62	.04	-0.05	.52	-0.20	-0.01	70	.01	.19	.25	-0.04	.05
63	.48	-0.09	.13	.07	.00	71	.19	.27	.05	.19	-0.29
64	.25	.10	.11	-0.02	-0.14	72	.33	-0.01	.20	-0.01	.03
65	.05	.14	.13	-0.12	-0.03	73	-0.10	.46	-0.05	.12	-0.03
66	.29	.20	.14	.16	.10	74	.48	.05	-0.15	.03	.10
67	-0.29	.32	.01	-0.03	-0.04	75	.51	.04	-0.02	.08	.19
68	.50	-0.01	-0.05	.32	.03						

Table A-2
GAT 5-FACTOR ROTATION FOR RECRUIT ESTIMATES

Part 1. VARIMAX ROTATION ANALYSIS

PROPORTIONS OF VARIANCE

1	.0445	2	.0203	3	.0340	4	.0282
5	.0225						

HIGHEST LOADINGS

1	.6764	2	.4511	3	.5563	4	-.03826
5	.4770						

COMMUNITALITIES

1	.1971	2	.0456	3	.2338	4	.1359
5	.1128	6	.1162	7	.0984	8	.2218
9	.0478	10	.2030	11	.1461	12	.0948
13	.0666	14	.1720	15	.3494	16	.2357
17	.0926	18	.1240	19	.2659	20	.1486
21	.1652	22	.3085	23	.1439	24	.3490
25	.1445	26	.2017	27	.1256	28	.0387
29	.1343	30	.2727	31	.3393	32	.2301
33	.2527	34	.2581	35	.1420	36	.1577
37	.1684	38	.1420	39	.1770	40	.1961
41	.3211	42	.0525	43	.5032	44	.4211
45	.2659	46	.1177	47	.2225	48	.1420
49	.2793	50	.1814	51	.0944	52	.1359
53	.1020	54	.3013	55	.3070	56	.1791
57	.0668	58	.2933	59	.1559	60	.3275
61	.2155	62	.1424	63	.2553	64	.2004
65	.0221	66	.1440	67	.2452	68	.4132
69	.4422	70	.1542	71	.2654	72	.1473
73	.2037	74	.2703	75	.2710		

Table A-2 (continued)

Part II. ROTATED FACTOR LOADINGS													
Items		Factors					Items		Factors				
	1	2	3	4	5		1	2	3	4	5		
1	.42	-0.08	.01	-0.01	.12	16	.02	.06	-0.06	.02	.48		
2	.04	.07	.03	-0.20	-0.00	17	.08	.15	.21	-0.08	.12		
3	.44	.02	.07	-0.13	.14	18	.10	.10	.11	-0.22	.21		
4	.00	.03	.13	-0.29	.19	19	.36	.15	-0.13	-0.23	.22		
5	.25	.12	-0.07	-0.00	.17	20	-0.09	.17	.32	-0.04	.06		
6	.18	.03	.11	-0.12	.24	21	.32	-0.05	.24	.06	.03		
7	.22	-0.09	.11	.10	.12	22	.13	-0.08	.51	.15	.08		
8	.39	-0.03	.13	.04	.23	23	.42	-0.03	.05	.07	.12		
9	-0.15	.07	-0.08	.07	.08	24	.08	-0.17	.47	-0.26	.17		
10	.34	-0.14	.10	-0.22	.10	25	.06	.20	-0.01	.23	.22		
11	.07	.34	.01	-0.16	.02	26	.27	-0.08	.29	.17	.05		
12	.08	.21	-0.12	-0.00	.17	27	.10	.23	.21	.03	.13		
13	.15	.19	-0.04	-0.00	-0.07	28	.05	.16	.07	-0.07	.05		
14	.10	-0.01	.09	-0.17	.35	29	.31	.08	-0.01	-0.16	.09		
15	.57	-0.01	.02	-0.09	.14	30	.49	.04	-0.11	-0.11	.05		

Table A-2 (continued)

Part II. ROTATED FACTOR LOADINGS											
Items	Factors					Items	Factors				
	1	2	3	4	5		1	2	3	4	5
31	.54	.07	.10	-0.15	.11	46	-0.15	.20	.12	.00	.20
32	-0.19	.41	-0.07	-0.14	-0.00	47	.33	.01	-0.02	.03	.33
33	-0.16	.38	-0.17	-0.13	.18	48	.05	-0.02	.37	.00	-0.05
34	.44	.05	.05	-0.13	-0.06	49	.50	.04	.11	-0.01	.11
35	.18	.02	.15	.14	.26	50	.18	.02	.04	-0.38	-0.01
36	.09	.38	.05	-0.02	-0.01	51	.02	.07	.00	-0.29	.07
37	.35	.10	.15	-0.12	-0.04	52	.30	.17	.10	-0.02	.08
38	.13	.15	-0.06	.02	.32	53	.21	.05	.19	-0.13	.04
39	-0.12	.21	.34	-0.01	-0.02	54	.52	-0.11	-0.02	.05	.11
40	.41	.03	.00	-0.10	-0.12	55	.49	-0.04	.13	-0.21	-0.05
41	.06	-0.08	.56	.02	.04	56	.38	-0.01	.06	.18	-0.01
42	.02	.19	.09	-0.09	-0.03	57	.09	.09	-0.06	-0.22	-0.03
43	.68	-0.04	.07	-0.19	.04	58	.39	.05	-0.04	-0.35	.12
44	.59	-0.03	.13	-0.24	.01	59	.20	.03	.31	-0.04	-0.14
45	-0.22	.45	-0.06	-0.08	.07	60	.17	-0.12	.45	-0.25	.13

Table A-2 (continued)

Part II. ROTATED FACTOR LOADINGS											
Items	Factors					Items	Factors				
	1	2	3	4	5		1	2	3	4	5
61	.17	.33	-0.02	-0.27	-0.03	69	.54	-0.17	.23	-0.25	.03
62	.05	-0.05	.31	-0.17	-0.10	70	-0.09	.24	.05	-0.18	.23
63	.40	-0.04	.13	-0.24	-0.03	71	.38	.02	.35	-0.01	-0.02
64	.34	.01	.26	-0.10	-0.09	72	.18	.03	.09	-0.33	.03
65	-0.01	.05	.06	-0.12	-0.03	73	-0.14	.39	-0.04	.02	.15
66	.16	.07	-0.03	-0.22	.34	74	.35	.03	-0.14	-0.32	.16
67	-0.25	.37	-0.12	.15	.09	75	.31	.12	-0.19	-0.34	.10
68	.56	-0.17	-0.04	-0.13	.23						

Table A-3

GAT 5-FACTOR ROTATION FOR ROTATION ESTIMATES

Part I. VARIMAX ROTATION ANALYSIS

PROPORTIONS OF VARIANCE

1	.0684	2	.0323	3	.0308	4	.0247
5	.0301						

HIGHEST LOADINGS

1	.6298	2	.4717	3	.4154	4	-.04627
5	.5117						

COMMUNALITIES

1	.2903	2	.0530	3	.2169	4	.1456
5	.1798	6	.1887	7	.1538	8	.1742
9	.0440	10	.2408	11	.2327	12	.1258
13	.0439	14	.2355	15	.3698	16	.2263
17	.1062	18	.2040	19	.1861	20	.2225
21	.0756	22	.2148	23	.1963	24	.3301
25	.1527	26	.1764	27	.1739	28	.1242
29	.0688	30	.3277	31	.2372	32	.1606
33	.1430	34	.1733	35	.2018	36	.1201
37	.1226	38	.1338	39	.2977	40	.1200
41	.2499	42	.0900	43	.4448	44	.2440
45	.2322	46	.1313	47	.2784	48	.0711
49	.1809	50	.2122	51	.1255	52	.2340
53	.0931	54	.3033	55	.2175	56	.1245
57	.0985	58	.2424	59	.1332	60	.3731
61	.2569	62	.1266	63	.2456	64	.0907
65	.0477	66	.3071	67	.1036	68	.3462
69	.3830	70	.0738	71	.1553	72	.0985
73	.1073	74	.2330	75	.2123		

Table A-3 (continued)

Part II. ROTATED FACTOR LOADINGS												
Items	Factors					Items	Factors					
	1	2	3	4	5		1	2	3	4	5	
1	.22	-0.08	.37	.22	.22	16	-0.05	.21	.19	.10	.36	
2	.14	.06	-0.09	-0.15	-0.01	17	.03	.15	.12	-0.26	.04	
3	.34	-0.04	.32	.00	.02	18	.07	.05	.19	-0.11	.38	
4	.12	.18	.17	-0.02	.27	19	.30	.12	.25	-0.08	.11	
5	.04	.32	.25	.09	.08	20	-0.04	.21	-0.06	-0.41	-0.02	
6	.12	.06	.37	-0.13	.12	21	.18	.01	.13	-0.16	.04	
7	.21	.06	.32	.01	.12	22	.05	-0.11	.12	-0.41	.14	
8	.18	-0.01	.33	-0.02	.18	23	.27	.00	.33	-0.10	.08	
9	-0.17	.06	.03	-0.08	.05	24	.23	.10	-0.02	-0.16	.49	
10	.37	-0.06	.29	-0.02	.12	25	-0.11	.12	.27	-0.21	.07	
11	-0.01	.47	-0.06	-0.08	.02	26	.15	-0.07	.33	-0.21	.02	
12	.00	.34	.09	-0.01	.00	27	-0.14	.15	.11	-0.37	-0.01	
13	.10	.16	.01	-0.00	-0.01	28	.06	.34	.04	-0.09	.04	
14	.13	.08	.09	-0.02	.45	29	.13	.20	.16	-0.01	.08	
15	.52	-0.04	.28	.02	.12	30	.01	.10	.15	.16	.09	

Part II. ROTATED FACTOR LOADINGS

Items	Factors					Items	Factors				
	1	2	3	4	5		1	2	3	4	5
31	.46	.03	.14	-0.04	.08	46	-0.06	.17	.06	-0.29	.09
32	-0.17	.35	-0.04	-0.08	-0.05	47	.20	.13	.33	.02	.34
33	.01	.30	-0.07	.05	.07	48	-0.03	.01	.04	-0.23	.13
34	.40	.01	.12	.01	.04	49	.34	-0.01	.23	.05	.07
35	-0.04	-0.05	.33	-0.21	.21	50	.33	.19	.03	.07	.25
36	.01	.29	.04	-0.16	.03	51	.30	.12	.09	-0.08	.09
37	.19	.15	.15	-0.15	.14	52	-0.04	.47	.09	-0.10	.02
38	.08	.02	.15	-0.08	.32	53	.08	.22	.12	-0.15	-0.02
39	-0.20	.18	-0.08	-0.46	-0.06	54	.29	-0.10	.42	.10	.16
40	.30	-0.01	.07	-0.13	-0.08	55	.44	.00	.10	-0.08	.11
41	.05	-0.06	.05	-0.41	.28	56	.14	.08	.30	-0.09	-0.03
42	.09	.26	-0.03	-0.10	.03	57	.14	.21	-0.03	.15	.02
43	.63	-0.04	.14	.06	.08	58	.52	.10	.02	-0.14	.05
44	.47	.09	.03	-0.06	.13	59	.07	.04	.08	-0.14	-0.02
45	-0.21	.40	.04	-0.15	-0.07	60	.26	.03	-0.16	-0.21	.48

Table A-3 (continued)

Part II. ROTATED FACTOR LOADINGS											
Items	Factors					Items	Factors				
	1	2	3	4	5		1	2	3	4	5
61	.28	.40	-0.09	-0.01	.09	69	.60	.05	-0.03	-0.00	.14
62	.06	.17	-0.18	-0.25	.01	70	-0.02	.20	-0.05	-0.16	.06
63	.45	-0.05	-0.00	-0.02	.20	71	.13	.26	.04	-0.17	.20
64	.21	.13	-0.03	-0.15	.09	72	.25	.01	.09	-0.09	.14
65	.03	.16	-0.10	-0.08	.06	73	-0.16	.27	-0.05	-0.02	.01
66	.14	-0.01	.15	-0.25	.51	74	.46	.03	-0.00	.11	.08
67	-0.29	.12	-0.02	-0.04	.04	75	.42	.11	.14	.01	-0.00
68	.45	-0.05	.23	.19	.23						

Table A-4

SCORING KEYS FOR FINAL GAT SCALES

Scales		Item No.	Keyed Alt.			Item No.	Keyed Alt.			Item No.	Keyed Alt.		
Number	Title		NCO	REC	ROTC		NCO	REC	ROTC		NCO	REC	ROTC
1.	Good Work Habits	3	E	E	D	15	E	E	E	30	E	E	E
		31	E	E	E	34	E	E	E	37	E	D	D
		40	D	D	C	43	E	E	E				
2.	Leader-Follower Relations	10	E	E	E	19	E	E	D	44	D	C	D
		55	E	D	E	58	E	E	E	69	E	E	E
		72	D	D	D	74	E	E	E	75	E	E	E
3.	Fighting Man's Code	1	E	E	E	23	D	D	D	47	D	D	D
		54	E	E	E	56	C	D	B	68	E	E	E
4.	Marriage and Family	50	D	D	E	51	D	E	D	63	E	E	E
5.	Cynical View of Human Nature	11	B	A	B	12	C	C	B	13	D	D	D
		28	D	D	C	32	B	B	A	33	A	A	B
		36	D	D	C	42	B	C	B	45	A	A	A
		52	A	B	A	61	C	C	D	67	A	A	A
		73	A	A	A								
6.	Educated Sophisti- cation	17	D	C	B	20	A	A	A	22	B	B	A
		24	C	D	E	27	B	C	A	34	A	A	A
		41	C	C	C	48	C	B	B	50	D	D	B
		60	C	C	D	62	B	B	B				
7.	Personal Integrity	6	D	D	D	7	C	C	C	8	D	C	D
		26	B	C	B	35	C	D	B				
8.	Activities	4	D	E	E	14	D	D	D	16	C	B	C
		18	E	E	D	38	D	D	D	66	E	E	E

Table A-5

SCORING KEYS FOR FINAL GAT SCALES IN TWO DOL FORMS

Scales		Form	Item No.	Keyed Alt.			Item No.	Keyed Alt.			Item No.	Keyed Alt.		
No.	Title			NCO	REC	ROTC		NCO	REC	ROTC		NCO	REC	ROTC
1.	Good Work Habits	A	4	E	E	D	30	E	E	E	65	E	E	E
			66	E	E	E	75	E	E	E				
		B*	4	E	D	D	10	D	D	C	17	E	E	E
2.	Leader-Follower Relations	A*	20	E	E	E	40	E	E	D				
			20	D	C	D	36	E	D	E	40	E	E	E
		B	61	E	E	E	67	D	D	D	70	E	E	E
			72	E	E	E								
3.	Fighting Man's Code	A*	1	E	E	E	50	D	D	D				
		B	26	D	D	D	35	E	E	E	37	C	D	B
			60	E	E	E								
4.	Marriage and Family	B	29	D	D	E	31	D	E	D	51	E	E	E
5.	Cynical View of Human Nature	A	21	B	A	B	24	C	C	B	27	D	D	D
			59	D	D	C	72	B	B	A	73	A	A	B
		B	3	D	D	C	14	B	C	B	22	A	A	A
			33	A	B	A	47	C	C	D	58	A	A	A
			69	A	A	A								
6.	Educated Sophistication	A	37	D	C	B	44	A	A	A	48	B	B	A
			53	C	D	E	58	B	C	A				
		B	7	A	A	A	13	C	C	C	27	C	B	B
			43	D	D	B	46	C	C	D	50	B	B	B
7.	Personal Integrity	A	10	D	D	D	14	C	C	C	18	D	C	D
			55	B	C	B								
		B*	2	C	D	B								
8.	Activities	A	5	D	E	E	29	D	D	D	35	C	B	C
			39	E	F	D								
		B*	6	D	D	D	57	E	E	E				

*These scales are not to be scored for the particular form so indicated.

Table A-6
INTERCORRELATION OF GAT SUBSCORES IN 100-CASE SAMPLE

Scale ^a	Correlation Coefficients ^b															
1N	1R	1L	2N	2R	2L	3N	3R	3L	4N	4R	4L	5N	5R	5L	6N	6R
45	38	1L	16	02	-07	2N	25	30	25	3N	3R	3L	4N	4R	4L	5N
51	38	1L	26	33	25	43	21	2L	16	02	-07	2N	25	30	25	3N
11	38	1L	06	04	-11	66	21	2L	16	02	-07	2N	25	30	25	3N
2N	16	02	-07	2N	25	30	25	3N	16	02	-07	2N	25	30	25	3N
2R	26	33	25	43	21	2L	16	02	-07	2N	25	30	25	3N	16	02
2L	06	04	-11	66	21	2L	16	02	-07	2N	25	30	25	3N	16	02
3N	16	02	-07	2N	25	30	25	3N	16	02	-07	2N	25	30	25	3N
3R	11	34	07	02	14	26	48	51	33	3L	4N	4R	4L	5N	5R	5L
3L	24	-02	17	35	23	44	51	33	3L	4N	4R	4L	5N	5R	5L	6N
4N	40	14	26	09	15	-01	-04	01	18	4N	4R	4L	5N	5R	5L	6N
4R	17	59	23	-15	11	-13	07	19	-22	18	4R	4L	5N	5R	5L	6N
4L	22	13	43	-14	-03	-18	-08	-01	-15	41	27	4L	5N	5R	5L	6N
5N	33	29	26	34	48	12	43	28	33	39	14	21	5N	5R	5L	6N
5R	32	33	28	11	32	-07	19	15	12	29	19	17	61	5R	5L	6N
5L	15	09	29	29	32	16	29	17	24	31	-01	33	73	50	5L	6N
6N	48	08	35	16	08	07	09	12	25	33	-17	09	22	08	17	61
6R	22	50	29	-09	02	03	20	35	02	05	46	19	13	19	-00	18
6L	29	14	55	-10	21	-01	19	03	14	25	07	38	28	18	33	45
7N	29	43	31	02	23	-02	31	14	03	26	22	28	52	39	40	02
7R	04	33	20	05	02	02	04	04	-12	11	19	16	21	20	24	-13
7L	23	24	40	08	14	01	15	06	09	21	11	33	31	23	40	10
8N	54	59	46	10	32	03	29	24	17	51	35	35	52	39	40	30
8R	41	71	32	04	13	01	09	34	-03	31	55	26	30	36	26	16
8L	33	42	67	-02	18	-08	17	19	15	39	29	48	42	47	45	19
Mean	4.0	3.2	4.2	3.3	3.4	2.9	2.3	2.3	3.0	3.9	3.0	3.9	3.3	3.3	3.4	3.5
Sigma	.42	.63	.44	.37	.36	.41	.40	.41	.40	.46	.55	.50	.54	.50	.55	.55

^a N = MCC; R = Recruits; L = Newly commissioned ROTC Lieutenants.

^b Decimal points are omitted in the correlation coefficients.